FAA AVIATION NEWS

MARCH 1969

COVER

Jack Frost's icy hand is the often unseen enemy of winter pilots. For help on how to protect yourself, see page 4.

FAA AVIATION NEWS

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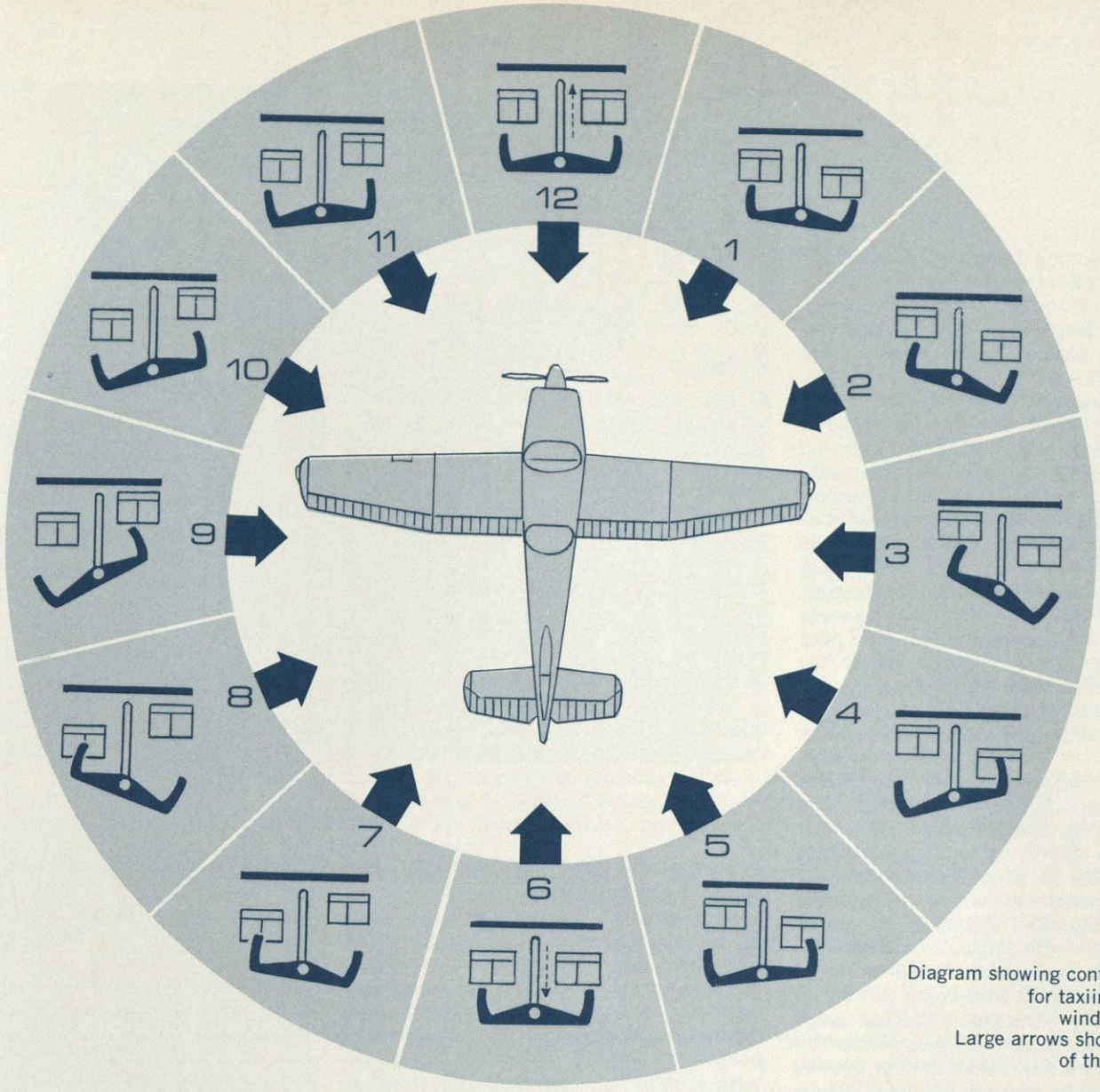


Diagram showing control settings for taxiing under all wind conditions. Large arrows show direction of the wind flow.

which way the wind?

Taxiing a light plane on a breezy day calls for something more than steering the nose wheel.

The winds of March can make taxiing the most difficult phase of operating a light aircraft, especially for the pilot who has no clear picture of how his airplane responds to gusty blasts across the airport. Unless wind pressures are properly counteracted while taxiing, the aircraft could lose directional control and possibly crash, groundloop or flip over.

Whenever the surface winds exceed 10 miles per hour, the lightplane pilot should be continually alert to adjust his directional controls as he taxis. Fore and aft trim must not be neglected. The elevator should be neutralized in a crosswind, held slightly aft in a headwind, and slightly forward in a tailwind.

With aircraft equipped with tricycle landing gear, it is especially important to keep the weight balanced on all three wheels. Directional control of the nosewheel is lost if there is excess downward pressure on the tail; and braking control, on the main gear, may be affected by too much lift on the wings.

Remember that the forward motion of your airplane must be taken into consideration—it will reduce the effect of a tailwind and enhance that of a headwind.

Lateral directional control requires use of *opposite* rudder. When the wind is blowing from the pilot's right, he should hold left rudder; with the wind on his left hand side, he should hold right rudder. This counteracts the tendency of aircraft to nose into the wind, or "weathervane" (a few tricycle gear equipped aircraft may want to turn tail to the wind and require coordinated control).

The ailerons should be either coordinated with or opposed to the rudder, depending on whether the wind is aft or forward of the wing. The intention here is to position the ailerons so as to prevent the wing nearest the wind from being lifted by a sudden strong gust of wind.

The concept of proper use of controls while taxiing may appear more difficult to explain than to carry out. The diagram above may be used to help pilots acquire the feel of "playing the wind" correctly. It's the mark of a pro. ■

Swift and sly, ice is a lurking menace aloft

ICING

There is nothing faster in a winter sky than Jack Frost's icy hand. You can be flying along at 5,000 feet with miles of visibility and no apparent clouds around you and suddenly your wings are glistening with ice. You take a quick look below for an emergency landing field and bring the plane down just before the glazing windshield becomes completely obscured.

Unexpected icing is not unusual. Recently an empty, hard-surfaced racetrack parking lot providentially offered a young pilot—with 60 hours in his logbook—an emergency landing area when he ran into severe icing conditions over Cincinnati. He had lost his VOR signal, and correctly assumed that the antenna was sheathed in ice. The pilot reported later that ice had covered the wings and all but about a two-inch strip of the windshield when he saw the parking lot. Fortunately, he brought the plane in safely.

Although the atmospheric conditions which produce icing on an aircraft in flight are well-known, and an adequate weather briefing can usually give ample advance notice of what to expect, some allowance must be made for the unexpected. Weather changes, often with dramatic abruptness and sometimes with tragic consequence.

Flight into known icing conditions should never be attempted unless the aircraft is equipped with de-icing or anti-icing equipment. A private pilot who continues his flight regardless of weather invites penalizing action under Federal Aviation Regulation 91.9 "Careless or Reckless Operation." Furthermore, FAR 121.629 "Air Carrier and Commercial Operators of Large Aircraft" and FAR 135.85 "Air Taxi and Commercial Operators of Small Aircraft" are specific in their limitations.

Danger in Letdowns

For example, FAR 21 prohibits even fully equipped air carriers with high-time crews from flying where severe icing is expected. In point of fact, jet aircraft normally fly at altitudes where temperature and moisture are too low to make icing a real threat. The danger, however, lies in the letdown at destinations, where the aircraft might be obliged to hold at comparatively low altitudes in icing conditions while awaiting a landing clearance.

What about the private, non-IFR rated pilot who finds himself overtaken by sudden and unexpected icing aloft? How is he to know when danger stalks and what can he do to extricate himself before it is too late?

Generally, the first sign that icing has commenced is the appearance of a thin coating on the windshield, sometimes preceded by frosting. This can also occur on takeoff and landing, and with sufficient rapidity to obscure the runway and other landmarks during these critical times in flight. Bush pilots in Alaska sometimes modify their windshield by cutting a small, three-inch-square hinged window into it to provide a "fail-safe" way of seeing forward if visibility is suddenly obliterated by ice. The blast of cold air is preferable to the alternative—flying blind.

No part of the aircraft is immune to icing, but for all practical purposes it accumulates primarily on the propeller spinner, propeller blades, engine cowling and air intakes, the upper leading edges of wings and tail surfaces, drop and tip tanks (on jet aircraft these generally ice first), pitot tube and static pressure ports, radio antennas, and other components which project into the air stream.

Icing of the propeller generally makes itself known by a slow loss of power and a *gradual* onset of engine roughness because the ice usually first forms on the spinner or propeller dome and then "migrates" to the blades themselves. Therein lies the greatest danger in propeller icing—ice accumulates unevenly on the blades, throwing them out of balance. The resulting vibration places undue stress on the blades and on the engine mounts, leading to their possible failure.

Because it is an airfoil, the propeller loses efficiency when ice build-up changes its shape. A loss of airspeed results, requiring an increase in power setting to keep the needle pegged at the required speed. But there is a limit to how much power is available. Constant speed propellers will automatically change into gradually lower pitch in order to hold rpm constant, but if a pilot needs to add power to maintain air speed and altitude and if there is vibration he should suspect propeller icing.

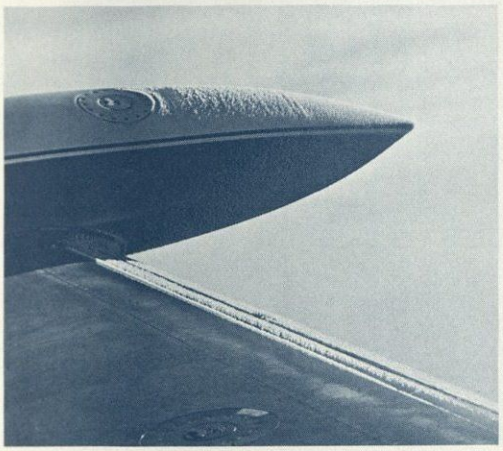
How Ice Builds Up

If the propeller is building up ice, it is a fair assumption that the same thing is taking place on the wings, tail surfaces and other projections. The weight of the accumulated ice, while a factor to be considered, is far less dangerous than the disruption of the air flow around the wings and tail surfaces. The ice changes the airfoil cross section and destroys lift, increases drag and raises the stalling speed. The latter is particularly hazardous on the landing approach and during landing. Pilots should "carry" more power than usual when landing an ice laden plane.

If ice covers or partially obstructs the pitot tube and static pressure ports, flight instrument readings will become inaccurate or cease altogether. Altimeter, airspeed, rate-of-climb indicator and turn-and-bank indicator, all vital instruments for safe operation of the aircraft, would be affected.

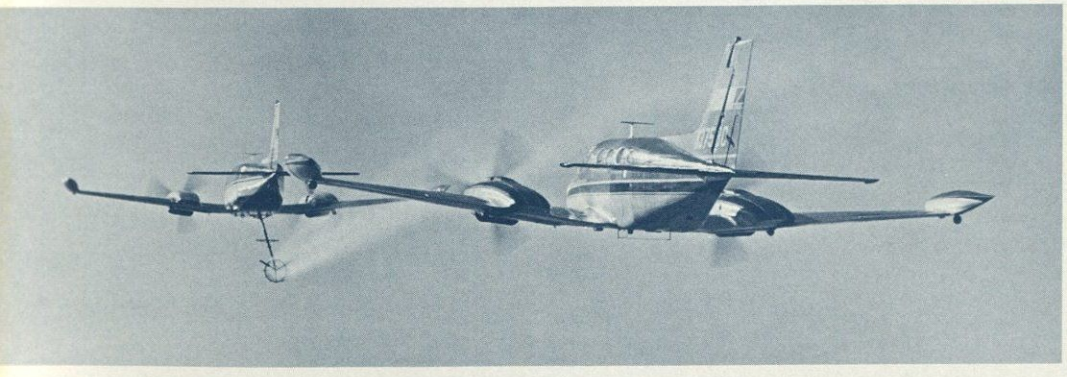
As seen in the example cited earlier, ice on radio antennas can knock out VOR reception and impair or destroy all com-

Aircraft windshields can ice over in an instant when freezing rain is encountered.



Above—rime ice like this forms instantaneously by freezing of small supercooled water droplets. It accumulates most commonly between — 10° C and — 20° C and severely distorts airfoil shape.

Below—this specially modified Cessna 411 is used by Cessna engineers to custom-make ice and rain conditions on demand. Better de-icing and rain clearing devices are expected to result from tests.



munication. This may have grave consequences, since efficient communication with the ground becomes urgent when flying through icing conditions—it is only through his radio link with the ground (and possibly other aircraft) that the pilot can be directed to a more favorable altitude or course away from the ice zone.

The pilot who encounters icing conditions while flying a plane unequipped with de-icing or anti-icing equipment should perform a 180° turn and land as quickly as possible.

When it is impossible to turn back—when the terrain is too rough to land safely, or when over a large body of water—two choices present themselves: (1) The pilot can descend to a lower, and presumably warmer altitude; or (2) he can *climb* to a warmer altitude.

The apparent contradiction in *climbing to a warmer* altitude is explained by the occasional presence of a temperature inversion. This involves a layer of warm air superimposed on lower layers of cold air and trapping them.

Provided the airplane is still capable of climbing, ascent to the warmer air might be the shortest way out, since icing conditions might easily extend all the way to the ground from the altitude where icing was first encountered. Even where no temperature inversion exists, climbing sometimes offers relief—the temperature at the higher altitudes might be cold enough so as to contain insufficient moisture for the formation of more ice.

Prompt action on the radio is important when icing starts. Get the latest weather report for altitudes above and below you, and the location of the nearest airport, even if it is one that was passed some time back. Time is critical when icing starts on a plane unequipped with de-icing or anti-icing equipment. The only way to halt the ice build-up is to find warmer or much colder air.

Wind tunnel tests have shown that moisture-saturated air flowing over a wing or other airfoil may cause icing in the presence of temperatures as high as 4°C. The temperature of the airfoil is cooled by evaporation and pressure changes which result from the flow of air around it. At the same time the airfoil is heated by the friction of moving air and by the impact of water droplets.

When an aircraft is flying at less than 400 knots, these cooling and heating effects tend to balance each other; therefore, ice forms usually when the temperature is below freezing. The most severe inflight structural icing occurs with temperatures between 0° C. and — 10° C. Icing is not uncommon at — 25° C., however, and has been noted at temperatures as low as — 60° C. (in thunderstorms and hurricanes).

Freezing Rain

Clouds are the most common form of visible liquid moisture. The supercooled water droplets, being in an unstable state, quickly turn to ice when disturbed by the passage of an aircraft. The most dangerous icing on aircraft structures is due to freezing rain. The buildup rate is so fast that only a few moments are required for serious flying hazards to exist.

De-icing and anti-icing equipment are expensive to buy, install and maintain, but it is the only effective way to operate safely in icing conditions. Some work has been done by various manufacturers, by the Air Force and to a limited extent by FAA to develop passive de-icing materials that can be applied to aircraft surfaces and propellers to prevent ice formation. The products developed so far have had limited effectiveness.

FAA's Aircraft Development Service began a six-week study of passive anti-icing materials on February 3 at the National Aeronautics and Space Administration's Lewis Research Center, Cleveland, Ohio. The tests do not involve actual flight, but are being carried out in a huge windtunnel which is equipped to provide a wide range of "weather." Test results are expected to be available within six months.

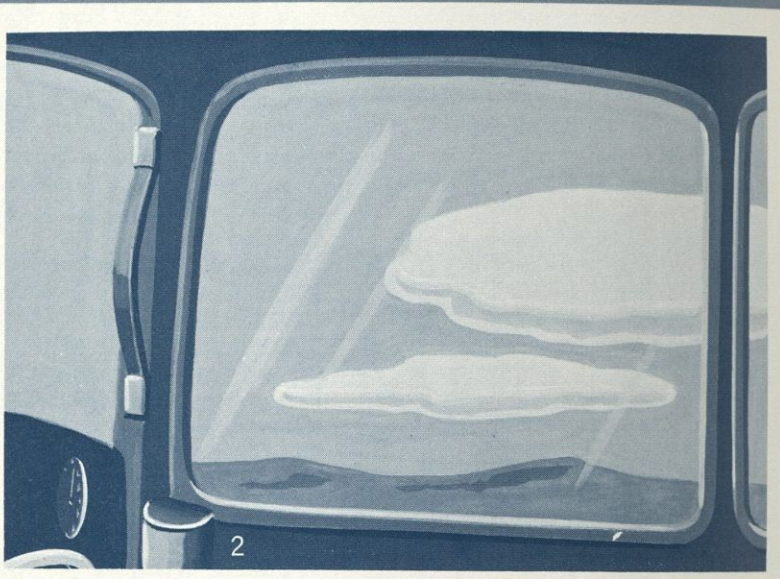
The problem of aircraft icing is constantly under attack by engineers, meteorologists, pilot associations and FAA. But the responsibility for avoiding icing conditions and responding properly to ice formation on the aircraft remains with the indivdual pilot. Don't try to outfly Jack Frost. He's too slick on the draw. ■

PERSPECTIVES IV

Fourth in a series on the uses of perspective vision as an aid to pilots in judging relative distances aloft.

STAYING CLEAR OF CLOUDS

Large cloud in foreground slips quietly by . . .



while distant cloud stands still.

Federal Aviation Regulations require a VFR pilot to maintain a lateral separation from clouds of at least 2,000 feet in controlled airspace. How can a pilot measure his distance from the nearest cloud? Clouds, like airplanes in the sky, are constantly moving, which complicates the problem of judging separation. Educated guesses necessarily involve wide margins of error, and the only reasonable procedure is to err on the safe side.

The art of perspective can help a pilot make a rough approximation of whether he is clearly legal or not. Clouds which appear to be standing still, or moving only slowly, compared with a point on the horizon, may be considered distant clouds, well beyond the 2,000 foot mark. Clouds which appear to move rapidly past the aircraft are close enough to require careful estimation of distance. If their speed of movement apparently increases, they are obviously getting closer: watch out. ■

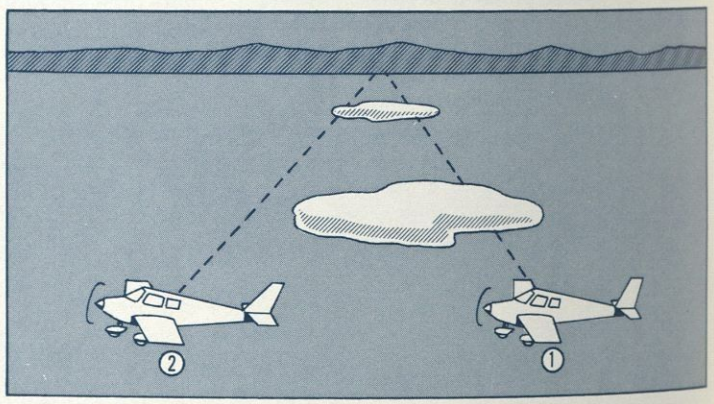


Diagram shows how perspective helps the pilot judge distance from clouds. As aircraft moves from position (1) to position (2), nearer cloud appears to slip past his cabin window, while distant cloud remains in view.

BLOWING THE WHISTLE ON NOISE

Proposed rule is FAA's first step in setting limits to aircraft engine noise in terminal areas.

Public response to the Federal Aviation Administration's notice of proposed rule-making on aircraft noise standards is now being studied carefully by FAA's Office of Noise Abatement. The agency has proposed to curtail the increase of aircraft noise around airports by establishing maximum noise standards for all categories of new subsonic transports and turbojet aircraft.

As outlined in the proposal, which was open to public comment from January 6 to March 12, the standards would require new aircraft types to operate at sound levels substantially below that of the noisiest aircraft now in service.

The regulation would not remove any of the responsibilities or powers now enjoyed by state and local authorities with respect to alleviation of local aircraft noise problems. It would compel aircraft manufactured for use in this country to be built in conformity with standards affecting the emission of noise.

This is the first regulatory action taken by FAA under the recently enacted Public Law 90-411 (1968), which grants the agency broad authority in noise control, including the authority to withhold certification of aircraft which fail to meet prescribed noise standards. U.S. Senate Report 1353, commenting on Public Law 90-411, stated that "the first order of business is to stop the escalation of aircraft noise by imposing standards which require the full application of noise reduction technology.

Accordingly, the first regulatory step is in the direction of the kind of aircraft that are most likely to raise the aircraft noise levels in airport neighborhoods—i.e., air carriers and general aviation jets. Eventually, as concepts of noise containment are fully developed, standards applicable to all types and weights of aircraft may be proposed and submitted for public comment.

The current proposal would measure aircraft noise on approach and takeoff. Sideline noise on takeoff would also have a specific measurement.

The noise limits on approach would range from 102 EPNdB (effective perceived noise decibels) for aircraft under 75,000 pounds up to 108 EPNdB for aircraft exceeding 600,000 pounds. The measurement of approach noise would be made at a point one nautical mile from the threshold on the extended runway centerline.

On takeoff, the noise limits would be in the 93 to 108 EPNdB range and would be measured at a point 3.5 nautical miles from the start of the takeoff roll on the extended runway centerline. Sideline takeoff noise would be measured at the point on a line parallel with and 0.25 miles from the extended runway centerline at the point where the noise level is greatest after lift-off.

Prescribed noise limits would be as much as 10 EPNdB less than the noise emitted by the noisiest aircraft now in service. A reduction of 10 EPNdB represents a reducing perceived noise by half.

The proposed regulation also prescribes a noise "floor" or objective of 80 EPNdB for all new aircraft—general aviation jets as well as air carriers—at all three points: approach, takeoff and along the sideline.

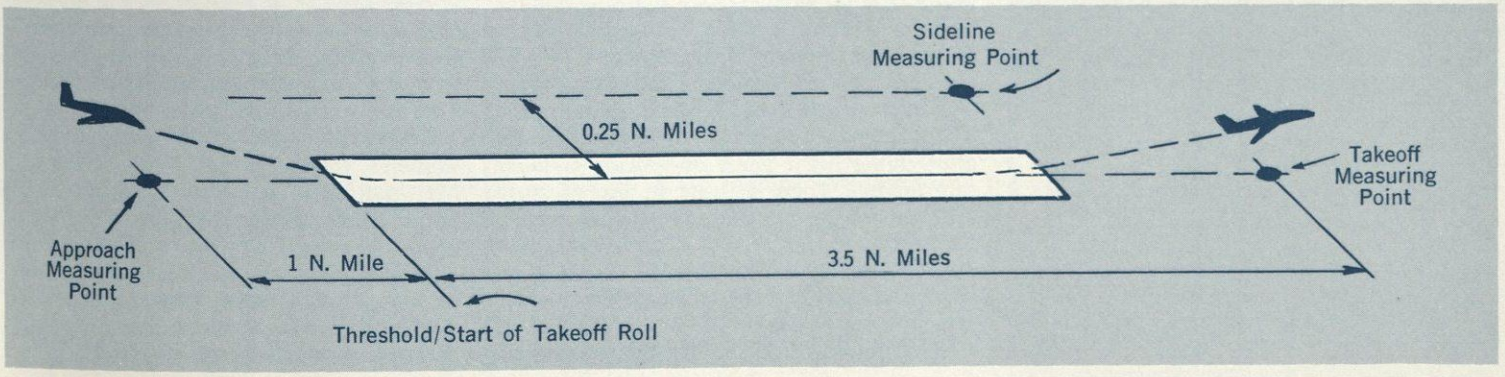
FAA recognizes that this objective may not be achievable to many current type designs. However, the standard would be established and enforced in all cases where it is economically reasonable and technologically practical.

Provision is made for "tradeoffs" in the maximum noise levels, to reflect the fact that total noise exposure is cumulative and that limited exceedances at certain measuring points may be acceptable if compensated by noise reductions at other measuring points. For example, an exceedance of two EPNdB would be allowed on takeoff if compensated by a similar reduction in the approach or sideline levels.

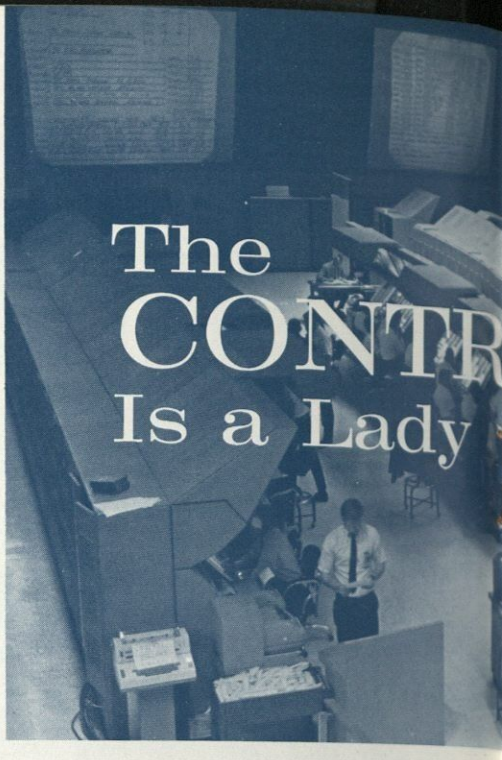
Effective perceived noise decibels are computed by a mathematical formula which takes into consideration the effect on the ear of tonal strength and duration of noise, as well as loudness and frequency. Accoustical research has shown that the actual annoyance generated by aircraft engines cannot be accurately measured by the latter two considerations alone.

Action on the proposed rule will be taken after careful study of public response to the proposal. ■

MEASURING POINTS FOR AIRPLANE TYPE CERTIFICATION



The CONTR Is a Lady



Above—the solitary female in the foreground of t what not long ago was a man's domain. She is a lad **left**—pert Mary Jo Craddock is a controller trainee i of air traffic control experience, Fran Scott is a Wat

Editor's Note: The past two issues of FAA Aviation News *carried articles on the newly expanded air traffic controller training program. This article spotlights the role of women in the air traffic profession.*

Can a pilot trust his life to a strange woman?

Suppose he's making an instrument approach through some very soupy fog with the visibility becoming marginal. With a hand that is starting to sweat, he picks up the microphone to report to the tower—and a sweet *feminine* voice acknowledges, telling him what to do with his plane.

Whether or not pilots may like the idea of being "controlled" by a woman, there is no reason to drop the mike if a woman answers. Female controllers are "all business" and thoroughly reliable. FAA has over 225 women working side by side with men as air traffic specialists in towers, centers and flight service stations throughout the system. This may be only a drop in the proverbial bucket when you consider that approximately 20,000 persons are employed in the system (little better than 1 girl to 100 men), but the woman-to-man ratio may change considerably in the next few years if the challenge to succeed in this field is taken up by women.

The issue of women's capacity for air traffic work is still unsettled. In the minds of some, there is a presumption that only men are capable of bearing up under the stress and strain of controlling aircraft in busy skies.

Women do not work the radar positions at high density airports such as Chicago's O'Hare or New York's John F. Kennedy, where more than a hundred aircraft may be landing or taking off in an hour. But this does not rule out the feminine touch in the IFR room. At the hundreds of facilities in the air traffic system, the working environment varies considerably, and may be more or less favorable to women.

Competent air traffic control specialist Dorothy L. Stover, giving a weather briefing, fits easily into the hustle and bustle of Kansas City's flight service station.

The air route traffic control center, for example, is usually located in a rural area far from any airport. Controllers never see the airplanes they control, and very seldom the pilots; they deal with electronic blips on a scope.

As many as 100 controllers may be on duty at one time, most of them grouped in a single large room working together in closely knit clusters of three or four. Traditionally, the center was an all-male environment, almost as much as a men's locker room, with an appropriately casual mood and manner. The introduction of a mini-skirted young lady into this environment could hardly be expected to go unnoticed. A certain amount of good-natured teasing, on the part of the male controllers and male pilots who contact the center on radio, was inevitable when the first lady controller bent over a scope.

But experience has shown that young ladies who are serious about their work, and who avoid any provocative manner of dress or behavior, are soon accepted by the men as co-workers. While the men appreciate a display of attractive legs or a whiff of imported perfume, they are too keenly aware of the responsibilities they carry for the safeguarding of human life to allow this sort of distraction. Girls whose primary interests are in surrounding themselves with susceptible men do not last very long in air traffic.

In a control tower the work load varies according to the local traffic. Some towers operate 24 hours a day with as many as a dozen men per shift; others may operate only daylight hours, with only one or two or three persons on duty for each shift. If the tower is radar-equipped, some of the work will be done at the radar scope in a darkened (IFR) room, but usually tower controllers rotate through all positions and spend some of their working hours in the tower cab, where they are in visual as well as voice contact with pilots.

The preponderance of men over women is not so impressive in a control tower, nor is there that sense of remoteness associated with the center. Because it functions as part of an airport, the tower affords its personnel frequent contact with local pilots, airport personnel, and other visitors of both sexes. Many young women find working conditions in a control tower more suitable to their nature than work in centers.

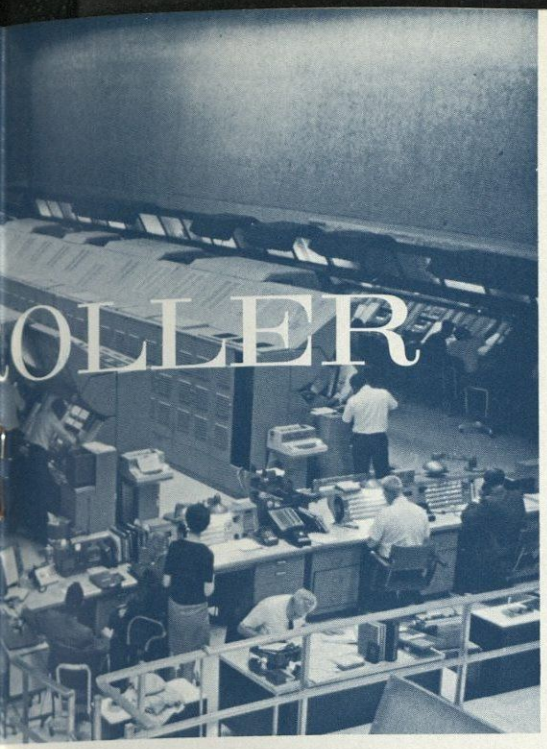
Flight service stations, also located on airports, are even more public than towers. There is a constant stream of visitors, mostly pilots filing flight plans or seeking weather information. There is little of the pressure associated with controlling heavy air traffic. From time to time, a lost pilot or a crippled aircraft may generate a dramatic situation for the station, but this is not a day-to-day, hour-to-hour occurrence.

Pilot response to the feminine voice on radio transmissions also varies, and is by no means universally recalcitrant.

"The calm voice of a woman can be very reassuring to pilots in distress. Women controllers in the Royal Air Force, talking pilots down to airports socked in London fogs, have proved this," according to Dr. Stanley Mohler of FAA's Office of Aviation Medicine, who compares the effect of a woman controller's voice on a lost pilot with the calming hand of a nurse on the brow of a feverish hospital patient.

Dr. Mohler also points out that "most women's voices transmit with great clarity over radios." The higher frequency of the sound seems to reproduce better than some men's voices.

While controllers need presence of mind in emergencies, many other less obvious qualities are needed too. Patience, empathy, helpfulness, a sense of responsibility, and



is view of the Washington, D.C., ARTCC is at home in y air traffic controller, one of a growing number. **Below** the Honolulu ARTCC. **Right**—with more than 20 years ch Supervisor at the Fairbanks Tower.

the ability to remember quickly and easily large quantities of details—numbers, letters and symbols—are qualities not the exclusive possession of men.

Much of the work done by air traffic controllers—keeping up flight strips, remembering positions, altitudes and types of aircraft under control, using special communications procedures and terminology—has its parallel in fields of communication or technical computation in which women have already made their mark. The "weaker sex" has always excelled at nimble-finger tasks.

Perhaps the most important single ability demanded of an air traffic specialist is his attention to small details. He must be able to concentrate—in a center the radar controller may be watching 10 or 15 aircraft on his scope at once. He must be alert to notice any alteration in flight from the notations on his flight strips.

Working in shifts around the clock requires the controller to be flexible— able to sleep in the daytime and work at night when called upon. Chivalry is not exactly dead in the FAA, but no woman who expects special favors, such as exclusion from the night shift, or Saturday and Sunday off, should be in air traffic work.

Who, then wants to be a lady controller? What kind of woman would put up with these working conditions?

One is Miss Elaine Jones, at the Honolulu Center. Elaine took up air traffic control work after clerking for the Air Force in Hawaii, Korea, Turkey and Vietnam; appearing in commercials; and acting as social director to Hawaiian tourists. Air traffic control work is the first job where she feels she really "counts." The sense of importance that comes with the job more than makes up for the irregular hours.

Another girl at the Honolulu Center, Mary Jo Craddock, is a recent graduate of the University of Alabama with a major in mathematics. A cute five-foot-two, and one of the five controller trainees and flight data girls in the 300-man center, Mary Jo gets along just fine with the male controllers. "I was usually the only girl in my math classes, too, so I'm used to it," she says. For Mary Jo, the intellectual challenge of her job is so rewarding that she has no concern with equality of acceptance.

The professional status a controller enjoys is the chief appeal to Shirley Warrens, who for many months took her solitary turn on the midnight watch at Ontario (Calif.) Airport Tower. Pride in her profession and the respectful place it holds in the eye of the public more than compensates for the minor inconveniences, such as dress restrictions. Her present supervisor bars miniskirts in the tower, so Shirley compromises with a semi-mini, just above the knee. Slacks are forbidden, at all facilities except on midnight to eight shifts, and so is anything far out in hippieland, but an ingenious female can always come up with something stylish as well as conforming.

The midnight (to 8 a.m.) shift is probably nowhere as solitary and haunting as in a tower in remote Fairbanks, Alaska. Sitting alone inside a glass cab, surrounded by swirling ice fog, the temperature outside a chilly subzero—this sounds more like a habitat for Hamlet's ghost than for a female controller. But to adventurous Fran Scott, this is business as usual. Knowing she has sole responsibility for the safety of the 25 or 30 aircraft that zoom out of the night keeps her mind from wandering.

Fran began her career 20 years ago as a young stenographer at the Kansas City Quartermaster's Depot. Anxious for excitement and travel, she and three girl friends headed west by train toward Arizona and California, finally ending up in Seattle, flat broke. A six-month CAA communications course prepared her for a job in Alaska, so off she went.

Alaska provided her with a career in air traffic, and the career led to romance. Fran soon married fellow controller Frank Scott, now a Watch Supervisor at the Eielson Air Force Base RAPCON.

Frank enjoys having a wife at home who understands him when he talks about his work. Working different shifts, they may not always see each other as much as the average married couple, but both feel that their jobs have more daily interest and excitement than any other work they could imagine.

Interest, excitement and adventure are some of the built-in advantages of air traffic control work for women. What about ambition? How far can a girl go?

Thus far, Watch Supervisor is the highest position that women hold. An outstanding example is Rogene Thompson, Watch Supervisor at the Anchorage Air Route Traffic Control Center, and one of seven recipients of the 1968 Federal Woman's Award—the highest honor awarded to women in government. Rogene earned her prize for helping reorganize the North Pacific air corridors.

But there is no real barrier, save perhaps a rapidly weakening prejudice, against women becoming Chief Controller at some of the less busy towers, or chief of a flight service station. The more women who prove their competence in their work, the broader will be their acceptance by men.

While it is safe to predict that men will dominate the air traffic profession numerically for some years to come, the chances look good that the 100-to-1 ratio will decline rapidly, and the day may not be distant when skirts in the control tower will not occasion a single raised eyebrow.

Well, maybe just one. Boys will be boys.

Nancy Koplinka

Rogene Thompson, Watch Supervisor at the Anchorage ARTCC, oversees 25-30 man controller shift. Miss Thompson holds one of the most responsible posts in ATC.

Burris and his newspaper companions had been covering Bonneville races.

GLAREBLINDNESS

How do you help a pilot who has suddenly gone blind in the cockpit, his companions are nonflyers and he cannot even give you his position?

This predicament was radioed to FAA's Salt Lake Airport Tower on a bright October afternoon, when Dave Lawton was manning local control and Preston Hunt had the approach control position. The appeal for help came from Keith Burris, a reporter for the Salt Lake City *Deseret News,* who had piloted a Bonanza to the Bonneville salt flats that morning to cover an automobile race.

Burris had taken off without his sunglasses, which had been stolen the previous day when he laid them on a counter in an operations room while he was preflighting his airplane. He was not concerned about sun glare because the sky was heavily overcast at Salt Lake. But at Bonneville, where the three newsmen remained for seven and a half hours, a bright sun broke through the clouds and the glare on the salt flats brought on an attack of "snowblindness" on the return trip. The following narrative was taken from the taped recording of the flight assist:

Bonanza: Salt Lake Tower, this is Bonanza 813 Romeo. I have an emergency.

Tower: Go ahead, Bonanza 813 Romeo.

Bonanza: I've been out on the salt flats, and I've developed some sort of snowblindness or glareblindness. I can hardly see at all. I've got two passengers, but they're not pilots. Can you get another aircraft in the air to help me in? I'm over the west side of Salt Lake.

Tower: Roger, Bonanza 813 Romeo. Standby, we'll see what we can do. *(Local controller Lawton, who received the emergency call, knew that a flight instructor, Lloyd Pack was making touch-and-go landings in the Salt Lake Airport pattern with a student in a Cessna 172. He contacted Pack on the radio).*

Tower: Cessna N42150, this is Salt Lake local control. We've got an emergency. Could you go out to the west side of the lake and help a snowblind pilot in?

Cessna 150: Affirmative.

Tower: I'll try to get a radar contact on him, and give you a vector out to him. We'll call you on approach control frequency—do you have that?

Cessna 150: Changing to approach control frequency 120.9.

Tower: Bonanza 813 Romeo, radar advises they see a target west of Antelope Island and one about 20 miles west of Stansbury. Do you have any idea how far out you are?

Bonanza: I assume that's about where we are.

Tower: 813 Romeo, would you be able to change frequencies to approach control.

Bonanza: There are a couple of people here with me who could probably help out. 120.9, is that correct.

Salt Lake Approach Control: Bonanza 813 Romeo, go ahead.

Bonanza: I developed some snowblindout at the salt flats. They're sending a Cessna out to help me get back in. Over.

Approach Control: Roger. Bonanza 813 Romeo, stand by. Cessna 150, turn right now heading 270. Radar contact three miles west of Salt Lake. Bonanza 813 Romeo, what is the heading now on your compass? Can someone read it? Over.

Bonanza: It's about 070 degrees.

Approach Control: Can you or someone see your compass all right? Can you turn left to a heading of about 050 for radar identification? Over.

Bonanza: I've got a person with me who can tell me when I've reached that. Over.

Approach Control: Roger. 050 is the heading. Cessna 150, turn left heading 250.

Cessna: Heading 250.

Approach Control: Bonanza 813 Romeo, turn right heading 070 again. Cessna 150, turn left heading 245.

Cessna: I believe I've got him! Bonanza 13 Romeo, can you tell me what your altitude is?

Bonanza: Approximately 7,500 or thereabouts. Over.

Approach Control: Roger. About 7,500. We've got an aircraft coming out to help you. He's about 4 miles from you. You're presently about 3 miles west of the airport.

Bonanza: Roger, and thank you.

Approach Control: Cessna 150, can you see the Bonanza now?

Cessna: Roger.

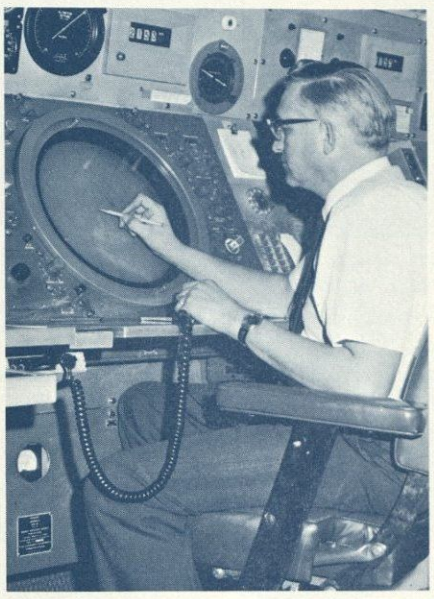
Approach Control: OK, I'll let you take over your own heading and circle around him as you see necessary. Bonanza 13 Romeo, there is an aircraft, a Cessna, just off to your left and ahead of you, about one mile, turning in front of you. He'll help you in.

Bonanza: Roger. We'll see what we can do.

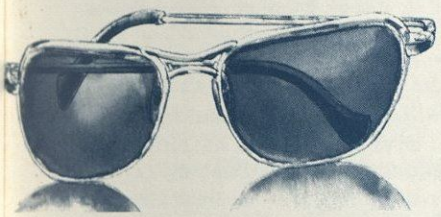
Approach Control: OK. Cessna 150, you can see the numbers on the Bonanza can't you? Is it 813 Romeo?

Cessna: That's right.

Approach Control: Fine. See what you can do to help him in. I'll keep you under



Top—stricken pilot Keith Burris (left) with rescue pilot Lloyd Pack (white shirt), Brent Checketts and Steve Parker, both passengers. **Below left**—Salt Lake Airport local controller Dave Lawton received first word that Bonanza 813 Romeo had a "blind" pilot at the controls. **Below**—Preston Hunt in the radar control position helped guide Pack to rendezvous with Burris.



radar surveillance to the airport.

Cessna: Salt Lake, can you ask him to slow down a little bit?

Approach Control: Bonanza 13 Romeo, can you slow your aircraft down a little? The Cessna is slower than you. He is just behind you now.

Bonanza: OK, I'll try to slow her down to about 120 if I can.

Approach Control: Bonanza 13 Romeo, advise when you see the ground, if you can. Will you be able to land the aircraft? Over.

Bonanza: I think when I'm lined up with the runway I can. I think I can tell from then on. Over.

Approach Control: Bonanza 13 Romeo, how much fuel have you got?

Bonanza: About half a tank.

Approach Control: Bonanza 13 Romeo, can you see the Cessna to the side of you now?

Bonanza: These people tell me he's right over here to my left. Over.

Approach Control: Is there anything we can do to help you, Bonanza 13 Romeo? Would you like to talk to a Bonanza pilot? The Cessna pilot is an instructor.

Bonanza: I appreciate any help you can give me. If they can get me lined up with the runway and take me down maybe to 50 feet or so, I think I can get her down. Over.

Approach Control: Roger. We'll give you headings and see if we can help you in to the airport. Cessna 150, are you familiar with the characteristics of the Bonanza?

Cessna: I am.

Approach Control. OK, maybe you can help him there and you can talk to him if you want to on this frequency, if you like. Go ahead now.

Cessna: OK. Bonanza, drop your gear and I'll check it for you.

Bonanza: Gear down.

Cessna: You're down all right. Now go about 15 degrees on flaps.

Bonanza: Flaps are out.

Cessna: Come back on the manifold pressure to about 15 inches.

Approach Control: Cessna 150, let's plan this for runway 34 right. Is that OK? We'll send out emergency equipment.

Cessna: 34 right is fine. OK, now, 13 Romeo, reduce your manifold pressure to 12 inches and go to full flap. Descend to about 5,000. Salt Lake, he's a little high. I'm going to have to turn him around south and bring him back in. 13 Romeo, make a right turn heading 160. Descend to 5,000 and I'll swing you back around here and land you on 34 right.

Bonanza: Thank you very much.

Approach Control: Cessna 150, might suggest you tell him when to turn and when to stop turn on the Bonanza. Maybe can't see the compass.

Bonanza: Well, I can see it, but it's extremely hazy. I can just barely read the numbers on it.

Cessna: OK, 13 Romeo, make a left turn. I'll tell you when to stop turning. Continue descent to 5,000. Keep her banking and keep her coming around to the left. You're too shallow.

Bonanza: Is that better?

Cessna: Fine. Stop turn. I'm right behind you here.

Approach Control: Bonanza 13 Romeo and Cessna 150, you're cleared to land runway 34 right. Wind 330 degrees at 10. Altimeter 3026.

Cessna: Hold your altitude, 13 Romeo. Now, make a very shallow right turn.

Approach Control: You're 2½ miles from the runway entering final.

Cessna: Come just a little bit to the left. You can descend a couple of hundred feet lower.

Bonanza: OK? How do I look?

Cessna: Just a little to the left. Bring it to the left. Come in to the left, just a little more. A little farther left now. Take it on the left a little more. Thataboy. Stop the turn there. Right there. Can you see the runway?

Bonanza: Not quite. I can see the ground, but I . . . wait, I just about can see it now.

Cessna: OK, you're all right. Just reduce your power. Pull your power out. All the way out. Hey, he's down!

Approach Control: Cessna 150, thank you very much and contact the tower, 118.3, when you get down.

Salt Lake Tower: 13 Romeo, proceed to turnoff, approaching about 20 feet ahead. 13 Romeo, we've got the fire truck ahead of you. Maybe you can see him.

Bonanza: I think I do. Oh, yes, I do, thank you.

Salt Lake Tower: OK. 13 Romeo, there will be a turn in about 20 to 30 feet. If you can see the fire truck, follow him.

Bonanza: I can see him now, thank you.

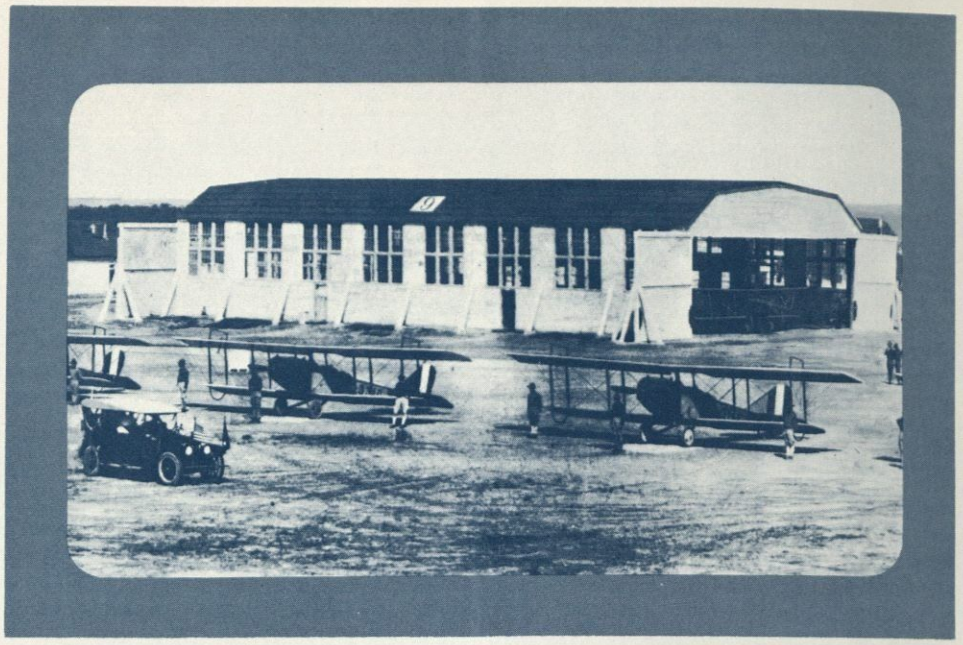
A few minutes later Burris and his two tense passengers were in the terminal, relieved and happy. The pilot, who has an instrument rating and a commercial license, soon recovered his vision and has continued to fly. However, you are not likely to catch him in the cockpit again without at least one pair of sunglasses.

famous

FLIGHTS

HANGAR No. 9

Ancient "Eaglet's Nest" Restored



Hangar No. 9, built in World War I, is a living relic of military aviation. Thousands of flying cadets studied basic aircraft maintenance within its walls and trundled venerable Jennies out its doors. **Left**—Col. H. C. Pratt, first commander of Brooks with his ornately monogramed "Jenny" in 1918 photo. **Right**—Capt. Henry H. "Hap" Arnold, later to become Army Air Corps Chief in WW II, was stationed at Brooks during the early '20s.

When the wind howls across the Texas plains near San Antonio, it rattles the half-century old timbers of a disused Air Force relic known as Hangar 9, stirring up ghostly memories of early heroes of aviation who once wheeled their *Jennies* out of the hangar and onto the flight line at Brooks Air Force Base.

Hangar 9, the oldest existing aircraft hangar in the Air Force, was one of 16 which formed a crescent along the northeast rim of Brooks' Field. Thrown up hastily as a "temporary structure" in 1918 (when the Air Force was called the Air Service, a minor appendage of the Army Signal Corps) Hangar 9 endured to become a familiar scene in the lives of thousands upon thousands of flying cadets who trained at Brooks during two world wars.

Between wars, Hangar 9 saw the Air Force transition from wood and fabric to sleek supersonic jets. In time, the aircraft outgrew the airfield; it is nearly 10 years since an operational airplane has been based on the field. The Air Force School of Aerospace Medicine now dominates military activity at the base. The last remaining hangar would have disappeared along with the airplanes, had it not been for the interest of the Bexar County Texas Historical Survey Committee, which has undertaken to restore the building and brighten the memories that gave it a niche in history.

One of the earliest memories concerns a day in March, 1924, when all eyes on the flight line turned skyward and stared in disbelief as a tattered *Canuck* clattered across the sky, trailing shreds of fabric from one wing and showing a tire missing from one wheel. The *Canuck* (a more powerful, Canadian-built version of the Curtis JN-4 *Jenny,* standard Air Corps trainer of the time) landed and fast-taxied to the hangar.

Out stepped a tall, gangling pilot who introduced himself as aviation cadet candidate Charles A. Lindbergh. He was preemptorily told to get his aeronautical apparition off the field—which he did, successfully, much to the surprise of nearly everyone, and flew it to nearby Stinson Field.

Even though he had already logged more than 250 hours as a barnstorming pilot, Lindbergh was put through the training mill like any neophyte Army student pilot. But when class work and flying training was done for the day, Aviation Cadet Lindbergh would hasten to Stinson Field where he in turn taught flying to civilians.

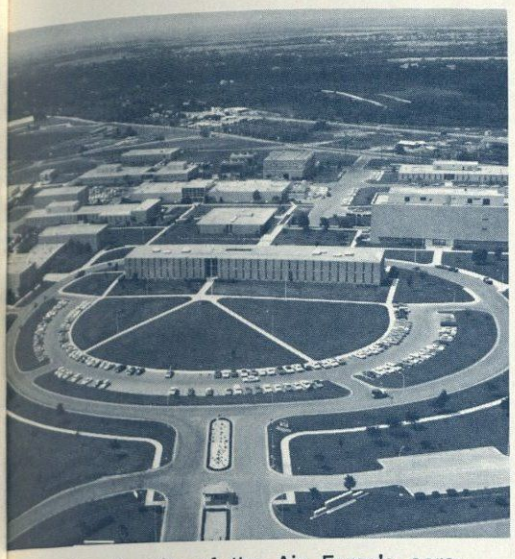
Another Brooks Field flyer with a bent for extracurricular activities was an instructor, Lt. John Macready. He found time on the side to establish a recordbreaking high altitude mark of 34,509 feet in September 1921, using a supercharged *Lapere* biplane.

Brooks Field was named for Sidney J. Brooks, a 22-year-old cadet from San Antonio who was killed on his final qualification flight. Previously, the site had been called Gosport Field, in honor of the Royal Flying Corps School at Gosport, England, which had developed one of the first aircraft communication systems. The Gosport device consisted of a funnel-shaped mouthpiece for the instructor, connected by tubing to "ear-phones" in the student's helmet, enabling the latter to receive oral inflight instruction over the racket of the engine. Conversation was strictly one-way, possibly on the assumption that a student had no comment of value to offer.

The standard Army trainer that trundled in and out of Hangar 9 in its early days was the fabled JN-4 *Jenny,* thought by many to be as 100 per cent American as apple pie. In point of fact, the name *Jenny* and the place of manufacture alone were American. The design was the work of B. Douglas Thomas, an aircraft designer with the Sopwith Aeroplane Co. of England. Thomas was hired by Glenn Curtiss to develop a tractor plane similar to the successful Sopwith models.

Several models were produced for Curtiss, among them a "J" and an "N." The best features of both were combined to produce a "JN" prototype and the JN series was on its way. It was only a short step for the young pilots training in the JN to slur the initials into a popular girl's name.

The durable *Jenny* not only lent wings to the fledgling air force, but in postwar years it also afforded many Americans their first sight of an "aeroplane." Slow and stable, easy to repair and forgiving of heavy-handed students, *Jennies* flew into the late '20s. At least two are still flying—one in Minneapolis, another in Reno.



Now the site of the Air Force's aerospace medical research, Brooks AFB is still blazing new trails in flight.

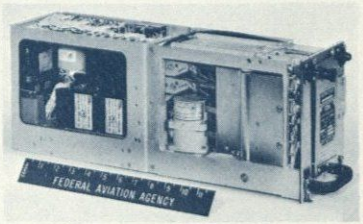
A notable director of flying at Brooks Field during the '20s was Captain (later Lt. Gen.) Claire Chennault. In the sky over San Antonio and in hangar sessions on the ground, he worked out the bold tactics that later were to make his Flying Tigers the terror of the China skies.

Other notables who first gained attention at Brooks Field included Major William C. Ocker and civilian Carl J. Crane, whose patience and persistence ultimately produced the Ocker-Crane system of instrument flying—one of the first "blind flying techniques" to be successfully demonstrated. It was later adopted by the Army Air Corps.

Curiously enough, one of the most important military demonstrations that took place at Brooks is credited to an infantryman, MSgt. Edwin H. Nickles, a veteran of World War I trench warfare. On September 28, 1929, Sergeant Nickles and a squad of 17 men introduced the concept of paratroops to the world with a mass jump over the airfield. Two by two, the men stepped out of nine DH-4s from an altitude of 3,000 feet. The static lines of their parachutes snapped taut and they all floated safely down to the field. At the same time, three padded bundles containing machine guns and ammunition were parachuted from three Douglas transports. Four minutes after the jump started, the machine guns were in action. The world's military powers took note—and action.

The sands of time were running out on the worn old building, with its "flying buttresses" and battered windows, when historically-minded Texans offered to restore it to its original condition. A grateful Air Force has accepted the offer, and will soon have the opportunity of displaying to the public a storehouse of venerable aviation memories. ■

BRIEFS



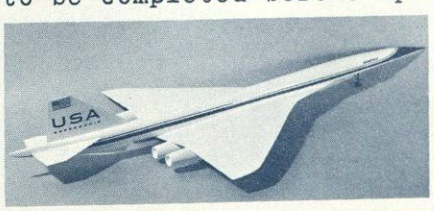
■ FLIGHT RECORDERS MAY BE MODIFIED to provide 19 kinds of information under a new rule proposed by FAA for air carriers. Recorders now in use give only time, heading, altitude, vertical acceleration (G forces) and airspeed. The new rule would provide for fourteen additional kinds of information, concerning airplane attitude, response to aerodynamic forces, flight control surface positions and engine performance.
Also proposed is an underwater locator device, to be attached to the record container, which would automatically sound off upon submersion in water, insuring prompt retrieval of the flight recorder. Comments on the proposal should be submitted before April 18 to the FAA Rules Docket, GC-24, 800 Independence Ave., S.W., Wash. D.C. 20590.

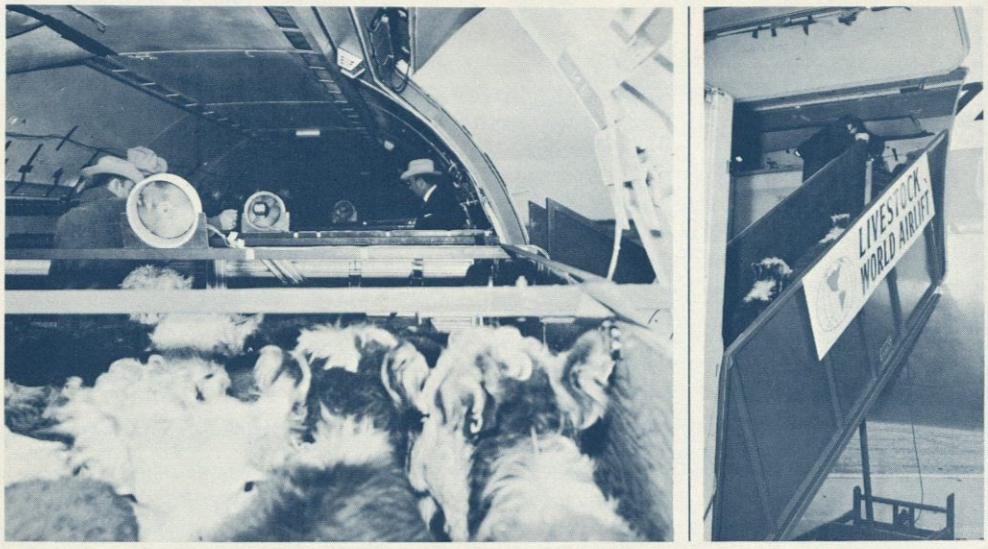
■ PILOTS INVOLVED IN NEAR-MISSES can continue to report details of the incidents without fear of adverse FAA action or breach of anonymity. FAA has extended the "no questions asked" near-miss reporting program which first went into effect in January 1968 for another year. Information derived from the reports has been extremely useful to FAA in its search for safer airways. A full report on the first year of the study will be available sometime in the first quarter of 1969, after all reports have been analyzed.

■ ADVANCED FLOW CONTROL PROCEDURES (AFCPs), now in effect in the New York area, require all IFR pilots bound for Kennedy, LaGuardia, or Newark to file their flight plan at least one and one-half hours before their proposed departure—one hour earlier than previously required. The New York Center will approve or assign a departure time, which pilots are expected to make good within plus or minus 15 minutes (otherwise they must request a new departure time).
The new procedures are designed to reduce inflight arrival delays by holding inbound aircraft on the ground when necessary. Whenever the delays forecast for the New York terminals exceed on hour, the departure of inbound IFR aircraft will be delayed sufficiently to prevent excessive buildup of aircraft holding in the adjacent airspace.

■ AN ILL WIND MIGHT BLOW SOME GOOD for many small airports having only one paved runway. FAA has reduced the maximum recommended crosswind component for such airports from 15 to 12 miles per hour, an action that could make many more airfields eligible for financial assistance to construct additional runways under the Federal-aid Airport Program. The amendment of FAR Part 151, which became effective February 14, was adopted following study of flight operational and stability data for 35 small aircraft types.

■ BOEING'S FIXED SWEEP WING SST design data has been submitted to FAA and a technical evaluation is expected to be completed before April. It is being studied by a combined government review team of some 100 scientists and engineers from FAA, NASA and other government agencies, and the nine airlines sharing in the cost of the SST development program.





Git Along Li'l Doggie, Git Along and hit that not so dusty trail in the sky. Cattle men in Ft. Worth recently loaded 262 young Herefords aboard a stretched DC-8 for a 6,280-mile trip to Chile where they will be used to establish a livestock industry. Between 6,000 and 7,000 Herefords will be airlifted to Chile in a $2.2 million transportation package.

Agency Proposes Smoke Hoods As Safety Measure

In an effort to reduce loss of life or possible serious injury due to fire and smoke inhalation following a "survivable" airplane crash, FAA has proposed a rule that crew and passengers be provided with lightweight, easy-to-don smoke hoods. The proposal would apply to air carriers and aircraft operated by air travel clubs.

The value of such hoods has been demonstrated at FAA's Civil Aeromedical Institute (CAMI) in Oklahoma City. After a lengthy investigation, a satisfactory lightweight, plastic, fireproof smoke hood has been developed which provides face and lung protection during the vital seconds of evacuation following a crash landing.

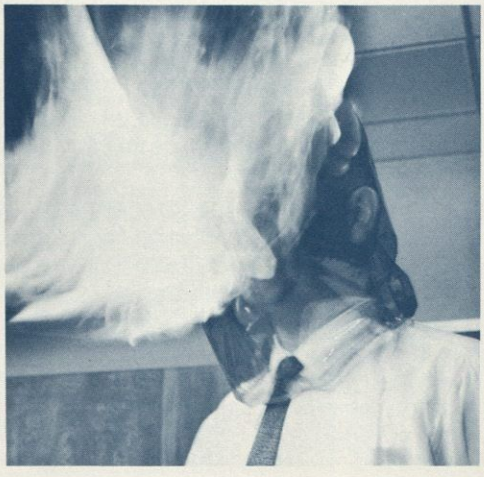
According to the proposed rule, aircraft manufacturers seeking certification of new aircraft would have to demonstrate that the plane could be evacuated within the established 90-second limit by persons wearing smoke hoods. Airline operators introducing new equivalent or certain kinds of modified equipment would also have to abide by the same rules. In addition, demonstration of the smoke hoods by flight attendants would become a regular part of passenger briefing prior to each flight.

Standards laid down in the proposal for smoke hoods require that they be made of a transparent material and designed to allow the wearer adequate all-around horizontal visibility. The FAA proposal carries five specifications for the hoods:

(1) They must be large enough to contain at least 25.6 liters of breathing air and allow the wearer freedom of movement and voice communication; (2) resist sudden temperature rises to as high as 1,200 degrees for at least five minutes without igniting, melting, or yielding hazardous amounts of toxic products and withstand exposure to 18-inch-long yellow flames for not less than 30 seconds.

Also: (3) they must be flexible but still stiff enough to stand away from the face and not be drawn against the nose or mouth, and not fog up under heavy breathing conditions; (4) contain a firm but comfortable closure around the neck to prevent inflow of contaminated air; and (5) be non-irritating to the skin and not deteriorate with age, retaining enough tensile strength to prevent tearing at temperatures up to 750 degrees.

Comments on the proposal (Docket 9344, Notice 69-2) should be submitted to Federal Aviation Administration, GC-24, Washington, D.C. 20590, before April 11, 1969.



Jet Engine Noise to be Studied; STOL Noise Seminar Notes Available

FAA has awarded a $665,241 contract for a two year study of compressor fan noise prediction methods to the Pratt and Whitney, United Aircraft Corp. Pratt and Whitney will fund 45 per cent of the total research costs ($1,209,530), with the Federal Government providing 55 per cent.

The project consists of seven phases of theoretical and experimental work: fundamental relationships which influence noise, noise prediction methods, verification of noise prediction technique, noise reduction, noise measurement of supersonic test vehicles, evaluation of fan noise reduction methods and correlation of theory and experimental data.

A complementary cost sharing contract was awarded to General Electric last June. Objective of the research is a noise prediction technique which will enable manufacturers to evaluate newly designed aircraft with respect to noise standards before costly prototypes are built.

Noise and STOL aircraft was the subject of a government/industry conference last month in Washington which may lead to noise certification standards for short takeoff and landing aircraft.

Summary abstracts of the meeting may be obtained from FAA's Office of Noise Abatement, NO-10, Wash. D.C. 20590.

(See p. 7 for proposed rule on noise limits.)

Grooved Runways Might Hold Answer To Improved Aircraft Braking

A welcome fringe benefit from runway grooving, which was developed originally to help prevent aircraft from hydroplaning on wet runways, is an apparent improvement in braking effectiveness.

This was verified in the course of a nine-month-long series of tests at Washington National Airport where thousands of transverse grooves had been cut into the 6,870-foot north-south runway in the spring of 1967. (*FAA Aviation News,* June 1967.)

The tests at DCA were undertaken to compare friction values of wet and dry runway surfaces before and after the runway was grooved. FAA project engineers, William A. Hiering and Charles R. Grisel of the National Aviation Facilities Experimental Center (NAFEC), used a "skiddometer" as their chief investigative tool.

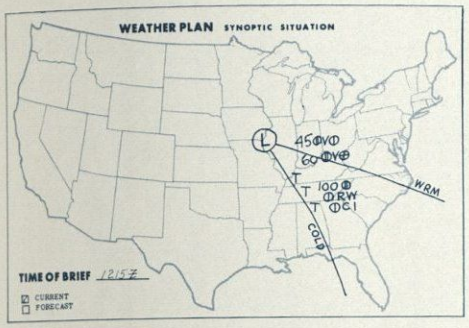
Copies of "Friction Effects of Runway Grooves, Runway 18-36, Washington National Airport," AD 678 645, may be obtained for $3 from the Clearinghouse for Federal Scientific and Technical Information, Springfield, Va. 22151. Order should include the "AD" number, title, and a check or money order made payable to the CFSTI.

• Whence Weather Forms

It was with great interest that I read your article in the December, 1968, issue entitled "Weather Wise and Plane Safe."

For some time now I have been trying to find just some presentation as this for putting the information that I receive from the FSS briefer into a form that I may understand and retain. I strongly suggest that you make this a common item at all flight service stations.

George R. Evans, Jr.
Waretown, N.J.



FAA is considering making the Cirillo weather reporting forms available at flight service stations. Please watch these columns for an announcement of their availability. In the meantime, we are sending you a few forms we have on hand.

• Just in Case

Your article in the September *Aviation News* mentions "chaff" and its use in locating aircraft with inoperative radio equipment. You mentioned six chaff manufacturers—can you supply me with the name and address of the nearest supplier?

Richard M. Jacobs
Kansas City, Mo.

The Demac Corp., P. O. Box 394, Hicksville, N. Y. 11802. It is our understanding the chaff is packed four small boxes to a carton—enough for one complete emergency procedure —and sells for about $10.

• The View from the Tower

I have made it a habit to stop in at the control tower of every major city airport I drive past or fly into. Recently, while on a commercial flight, I had quite a bit of time between connections in Phoenix. I decided to visit the tower for a few minutes.

Well, your guys in the tower, and down in the radar room, were so friendly and informative that I ended up spending almost four hours in the tower and the radar room.

My special thanks to Lloyd Golden in the tower who was kind enough to take time out to show me around and also to the guys in radar. You've got a friendly bunch of guys at Phoenix.

Robert A. Anderson
Provo, Utah

Consistent with safety, it is official FAA policy to encourage persons to visit its facilities, particularly flight instructors and their students, fixed base operators, and others actively engaged in aviation. However, advance *permission is required for tower visitors. A phone call ahead will usually do the trick.*

• Any Chaff Saves?

Apropos the "chaff" article in the September *Aviation News,* does FAA have any record of actual incidents in which chaff was successfully used under emergency situations?

Carlton G. Bucher
White Plains, N. Y.

FAA's Air Traffic Service records do not show any actual "saves" made using chaff. However, tests conducted last year by FAA in conjunction with the Aircraft Owners and Pilots Association showed no reason why the chaff technique would not work well under emergency conditions.

In the early tests, controllers were alerted that the tests were under way in their vicinity and to be on the look out for a radar return. This phase went well, as did the later part of the test when aircraft flying in the vicinity of Washington, Baltimore, Richmond and Roanoke released chaff without preliminary warning to controllers. In all instances the chaff showed up on radar.

• Knots/Miles Battle Report (Cont.)

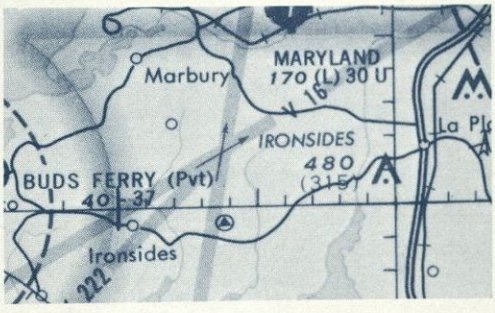
In the knots vs miles controversy put me down as a kilometer man. The scientific and industrial community is moving toward the metric system. Army maps are now metric. Most of the land is calibrated by the metric system. It seems appropriate that the aviation community lead the U. S. into the metric world.

William D. Zimsen
Bremerton, Wash.

• Identifying Aerial Intersections

I'd like to suggest FAA include intersection information, station ident, frequency and radio on sectional charts. This information is printed on other charts but it is not readily available to VFR pilots using sectionals.

Albany, Oregon



Sectional charts do contain intersection information, depicted by crossed arrows and identified by name. The arrows point to the radio NAVAIDS, whose radials form the fix. Station identification and frequency are thus easily obtained.

• An Enlightened Public

Thank you for the recent article "Coping With the Future" by FAA Deputy Administrator Oscar Bakke and "Area Navigation" by Robert W. Martin of FAA's Air Traffic Service. I appreciate the forward thinking demonstrated by both men.

FAA Aviation News welcomes comments from the aviation community. We will reserve this page for an exchange of views. No anonymous letters will be used, but names will be withheld on request.

It seems to me that unless one reads of what FAA is planning to do to improve conditions in airspace, one can very easily be negatively influenced by some of the provocative literature being written about current conflicts.

Hardwick, Ga.

• Car to Plane Radio

The article "Up, Up and—Where Am I?" in the November, 1968 *Aviation News* describing the plight and happy ending of a lost sailplane pilot was well done but it left a question. You state that the youthful pilot was in radio contact with his father on the ground via a radio in his father's car.

I was not aware that a radio in a private automobile could be licensed in the aviation services. Can you tell me how this can be done? The application I have in mind is for local Civil Defense communications with volunteers' aircraft.

John V. von Sneidern, Jr.
Bronxville, N. Y.

You are correct—a radio in a private automobile cannot be licensed for aviation use. Dr. Muxworthy was using a portable radio. The Federal Communication Commission issues licenses for "Aviation Instructional Station" and for "Citizens Radio Service" categories. Sailplanes usually use the former, transmitting on 123.3 or 123.5 Mhz.

Each FCC category has its own requirements and limitations. You can get full information on these and on your special civil defense communications needs by writing to Raymond L. Day, Aviation and Marine Division, FCC, Washington, D. C. 20554.

• Paris in the Springtime

I'll be going abroad for an extended stay soon, making my headquarters in Paris, and I am turning to *FAA Aviation News* for help in locating a couple of aviation spots of interest in Europe. Having shed my pinfeathers many years ago in a *Jenny,* my interest is in things historical, rather than in the current state of the art.

Howard Leffel
New York, N. Y.

The Museum of the Air in Paris has one of the outstanding aircraft collections in the world. The same may be said for the Deutches Museum in Munich, and the Science Museum in London. In fact, Europe is a trove of aeronautical artifacts. Your attention is directed to "Museum and Display Aircraft of the World" by Stephen Muth, published by the American Aviation Historical Society, P. O. Box 45-435, Los Angeles, Calif., 90045. Price: $2.50.

• The CAM 18 (Again)

On the *Forum* page of your November, 1968, issue you stated that CAM 18, the so-called "Mechanic's Bible," has been replaced by *two* other publications, AC 43.13-1 and AC 43.13-2.

Actually CAM 18 has been replaced by three publications, the third being FAR Part 43.

Charleston, West Va.

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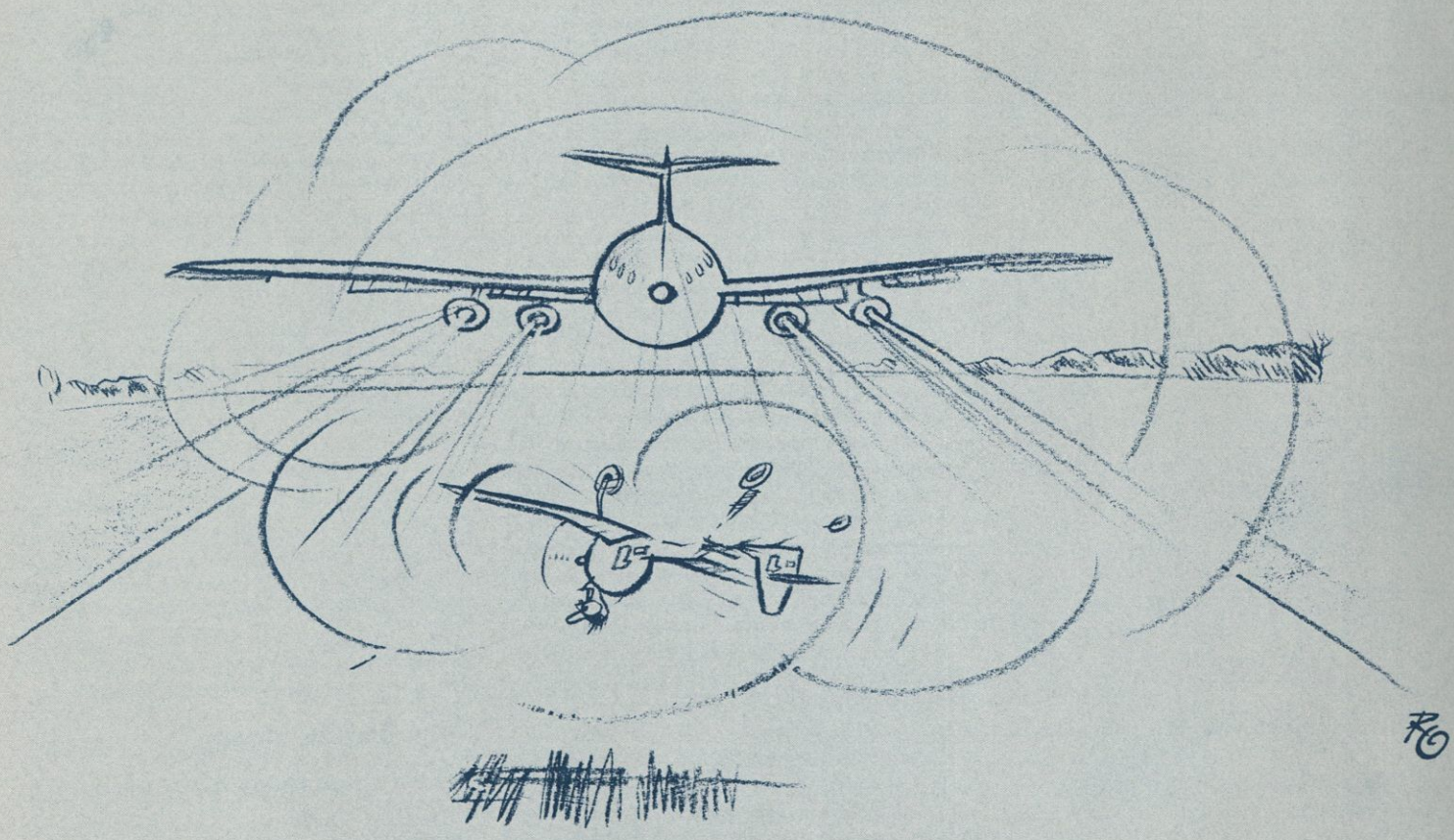

Lead to Yours

Suggested by Ed. Bushong